

REMARKS/ARGUMENTS

The Office Action mailed August 3, 2007, has been received and reviewed. Claims 1 through 8, 10 through 14, 16 through 25, 68, and 69 are currently pending in the application. Claims 1 through 8, 10, 16 through 19, and 22 stand rejected. Claims 11 through 14, 20, 21, 23 through 25, 68, and 69 have been withdrawn from consideration as being drawn to a non-elected species.

Applicant respectfully requests reconsideration of the application.

Information Disclosure Statement

As detailed in Applicant's previous response, Applicant notes the filing of an Information Disclosure Statement herein on September 21, 2006, and notes that no copy of the Form PTO/SB/08 was returned with the outstanding Office Action. Applicant respectfully requests that the information cited on the Form PTO/SB/08 be made of record herein.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Statutory Invention Registration No. H72 to Wise *et al.*, in View of U.S. Patent No. 5,449,423 to Cioffe, U.S. Patent No. 5,320,691 to Weber, and U.S. Patent No. 4,570,540 to Bell

Claims 1 through 8, 10, 16 through 19, and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Statutory Invention Registration H72 to Wise *et al.* ("Wise"), in view of U.S. Patent No. 5,449,423 to Cioffe ("Cioffe"), U.S. Patent No. 5,320,691 to Weber ("Weber"), and U.S. Patent No. 4,570,540 to Bell ("Bell"). Applicant respectfully traverses this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, there must be "a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Finally, to establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800

F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure.

DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co., 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The obviousness rejection of claims 1 through 8, 10, 16 through 19, and 22 is improper because the applied references do not teach or suggest all of the claim limitations and because there is no reason that would have prompted a person of ordinary skill in the art to combine the applied references in the manner asserted.

Wise teaches a black powder substitute that includes potassium nitrate, sulfur, and an organic crystalline compound. Wise at the Abstract. Upon ignition, the sulfur in the black powder substitute is chemically reduced and provides less reactivity to the organic crystalline compound. *Id.* at column 7, line 65 through column 8, line 2 and column 9, line 26 through column 10, line 7. The organic crystalline compound is fluorescein, phenolphthalein, 1,5-naphthalenediol, phenolphthalin, anthraflavic acid, terephthalic acid, alkali metal salts thereof, mixtures thereof, quinalizarin, quinizarin, leucoquinizarin, hydroquinone, catechol, salts thereof, and mixtures thereof. *Id.* at column 2, lines 31-44.

Cioffe teaches an explosive composition that includes potassium perchlorate, an organic or inorganic nitrate, and an organic acid or salt of the organic acid. Cioffe at column 1, line 60 through column 2, line 2. The organic acid has a chemical formula of $C_6H_8O_6$ and includes ascorbic acid, erythorbic acid, 5,6-carbonyl ascorbic acid, 5,6-erythorbic acid, D-glucuronolactone, isoascorbic acid, tricarballic acid, salts thereof, or mixtures thereof. *Id.* at column 5, lines 38-45. Organic acids "having more than 6 carbon atoms but which have similar reactivity may also be used." *Id.*

Weber teaches a black powder substitute that is free of charcoal. Weber at the Abstract. The black powder substitute includes unconverted phenolphthalein, potassium nitrate, and sulfur in a binding phase of phenolphthalein salt. *Id.* at column 1, lines 38-43. The black powder substitute also includes a binder, such as a vinyl alcohol acetate resin or a polyvinyl alcohol resin. *Id.* at column 2, lines 61-66.

Bell teaches an explosive composition that includes a metallic nitrate and cellulose acetate. Bell at the Abstract. Bell teaches that, due to the absence of sulfur, the composition is less hazardous than black powder composed of sulfur, charcoal and a metallic nitrate. *Id.* at column 2, lines 25-40.

It is respectfully submitted that none of the applied references, alone or in combination, teaches or suggests all of the limitations of claim 1. Specifically, the applied references do not teach or suggest the limitation of a “solid pyrotechnic composition consisting of from about 40 weight percent to about 90 weight percent oxidizer particles, the oxidizer particles having a mean particle size of not greater than about 30 microns and comprising at least one of an alkali metal nitrate and ammonium nitrate and at least one of an alkali metal perchlorate and ammonium perchlorate; organic crystalline particles accounting for from about 10 weight percent to about 60 weight percent of the total weight of the solid pyrotechnic composition, wherein the organic crystalline particles comprise an organic crystalline compound comprising at least one of phenolphthalein, an organic crystalline compound derived from a reaction between a phenolic compound and phthalic anhydride, fluorescein, 1,5-naphthalenediol, and terephthalic acid; and a nonhygroscopic polymeric binder,” as recited in claim 1.

Applicant notes that the transitional phrase “consisting of,” as recited in claim 1, excludes any elements or ingredients not specified in the claims. *See* M.P.E.P. § 2111.03. Although Wise teaches a composition that includes potassium nitrate, sulfur, and phenolphthalein, Wise does not teach or suggest a composition that includes “oxidizer particles...comprising at least one of an alkali metal nitrate and ammonium nitrate and at least one of an alkali metal perchlorate and ammonium perchlorate,” as recited in claim 1. Thus, Wise does not teach or suggest a material that consists of the components recited in claim 1.

The Examiner relies on Cioffe as teaching “that it is known to use a mixture of oxidizers including potassium nitrate and potassium chlorate of 35-69.5% and of size 1-20 microns in a composition that is a substitute for black powder.” Office Action of August 8, 2007, page 2. However, Cioffe teaches a composition that includes potassium chlorate, potassium nitrate in addition to an organic acid with the chemical formula of C₆H₈O₆. *See* Cioffe at column 5, lines 38-45. Cioffe does not teach or suggest utilizing a combination of potassium chlorate and potassium nitrate in the absence of an organic acid, nor has the Examiner provided any reasoning

that would lead one of ordinary skill in the art to reasonably expect that the combination of potassium chlorate and potassium nitrate could be used in the absence of the $C_6H_8O_6$ organic acid. Since combination of Wise and Cioffe would include additional elements, such as the $C_6H_8O_6$ organic acid, Wise and Cioffe do not teach or suggest a composition that consists of the components recited in claim 1.

Because neither Wise nor Cioffe teaches or suggests a nonhygroscopic polymeric binder, the Examiner relies on Weber as curing this deficiency. Although Weber teaches a composition that includes a PVA resin vinyl acetate polymer, the composition of Weber includes several other elements, such as sulfur. Thus, any combination of Wise, Cioffe, and Weber would produce a composition that includes sulfur. Therefore, combination of the applied references would not produce a composition that consists of the components recited in claim 1.

The Examiner acknowledges that the composition of Wise additionally includes sulfur. Thus, the Examiner relies on Bell as teaching “that it is known to remove sulfur from a composition that is a substitute for black powder.” *See* Office Action of August 3, 2007, page 2. However, while Bell teaches a sulfur-free composition that includes metallic nitrate and cellulose acetate, Bell does not teach or suggest removing sulfur from other compositions, such as those including different components. On the contrary, Bell states that the compositions “of this invention” have substantially reduced hazard properties due, in part to the total absence of sulfur. *See* Bell at column 2, lines 28-31. As such, the combination of Wise, Cioffe, Weber, and Bell does not teach or suggest a composition that consists of the components recited in claim 1. Therefore, Applicant submits that the applied references, alone or in combination, do not teach or suggest a composition that consists of the components recited in claim 1.

Applicant further submits that, without the benefit of hindsight, there is no reason that would have prompted a person of ordinary skill in the art to combine the applied references in the manner asserted. The Examiner asserts that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a mixture of oxidizers as taught by Cioffe since Cioffe suggests that mixtures of oxidizers are useful in a composition that is a substitute for black powder.” Office Action of August 3, 2007, page 3. However, Cioffe teaches compositions that include potassium perchlorate, an organic or inorganic nitrate-containing or

nitroguanidine oxidizing agent, and an organic acid as a fuel. See Cioffe at column 3, line 1-4.

Cioffe teaches the following:

“[t]he present invention is based on the discovery that mixtures of organic acids, such as ascorbic acid or erythorbic acid, or the carbonyl or salt derivatives thereof, potassium perchlorate and, a nitrate containing oxidizing agent, such as potassium nitrate, ammonium nitrate, nitroguanidine, or mixtures thereof, ***when properly formulated*** provide a novel ignitable, e.g. propellant or explosive, composition which is useful . . . in various propellant, explosive and pyro-technic applications.” *Id.* at column 2, lines 28-38 (emphasis added).

While the compositions of Cioffe include potassium perchlorate and potassium nitrate, the compositions are “properly formulated” with an organic acid to provide a composition having the desired properties. The Examiner has provided no reason to support the assertion that a combination of potassium perchlorate and potassium nitrate would function as desired in other compositions in the absence of the $C_6H_8O_6$ organic acid fuel. Thus, it is respectfully submitted that one of ordinary skill in the art would not be prompted to utilize the combination of oxidizers of Cioffe in a composition lacking a $C_6H_8O_6$ organic acid. In addition, there is no reasonable expectation of success in substituting/utilizing such oxidizers for/in compositions without an organic acid fuel, such as in compositions that consist of the components recited in claim 1.

The Examiner further asserts that one of ordinary skill in the art would be motivated to use the binder taught by Weber with the composition of Wise because Weber teaches that it is a known binder to be used in a composition that is a substitute for black powder. Office Action of August 8, 2007, page 3. However, Applicant respectfully submits that the Examiner’s assertion does not provide a reason that would have prompted a person of ordinary skill in the art to combine the applied references in the manner asserted. The Examiner has not provided any reasoning to support that one of ordinary skill in the art would reasonably expect the PVA resin vinyl acetate polymer of Weber to be successfully incorporated into the composition of Wise. Moreover, Weber teaches a method of forming a composition that includes phenolphthalein, sulfur, and potassium nitrate in addition to a PVA resin vinyl acetate polymer. See Weber at column 1, lines 37-42. Because the composition of Weber includes sulfur in addition to other components, there is no reason that one of ordinary skill in the art would assume that the use of PVA in a composition in the absence of sulfur would produce the same effect.

The Examiner also asserts that it is obvious to remove sulfur from black powder since Bell teaches that it is known to do so in order to reduce hazard properties relative to black powder. Office Action of August 8, 2007, page 3. However, Bell teaches that the “the compositions of this invention have substantially reduced hazard properties relative to black powder due to...the absence of sulphur [sic].” See Bell at column 2, lines 28-31. While the compositions of Bell are sulfur-free, the compositions include specific components (e.g., 45% to 65% of a metallic nitrate and the balance cellulose acetate). Thus, Bell does not teach generally removing sulfur from any explosive composition. The Examiner has not provided reasoning that one of ordinary skill in the art would reasonably expect that sulfur could be removed from the composition of Wise to produce a composition with the same properties. In the absence of any evidence or reasoning, Applicant respectfully asserts that it is mere speculation that sulfur could be removed from the composition of Wise.

The Examiner also asserts that the reason to combine the applied references is that each composition may be used a substitute for black powder. However, the Examiner has not provided anything other than mere speculation that individual components of the different compositions of Wise, Cioffe, Weber, and Bell could be combined to produce the claimed composition, nor that one would have a reasonable expectation of success in making such a combination.

Since the applied references do not teach or suggest all of the claim limitations and there is no reason that would have prompted a person of ordinary skill in the art to combine the applied references in the manner asserted, the obviousness rejection of independent claim 1 is improper and should be withdrawn.

Claims 2 through 8, 10, 16 through 19, and 22 are allowable, *inter alia*, as depending from an allowable base claim.

WITHDRAWN CLAIMS

Applicant considers claim 1 to be generic and notes that upon allowance of a generic claim, claims depending there from in a non-elected species would also be allowable. As such, claims 11 through 14, 20, 21, 23 through 25, 68, and 69 would be allowable as depending from claim 1.

CONCLUSION

Claims 1 through 8, 10 through 14, 16 through 25, 68, and 69 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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